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**LIBBY #3**

**DRAFT MEMORANDUM**

6/20/2005

**SUBJECT:** Amphibole Mineral Fiber Contamination of Various Source Materials in Residential and Commercial Areas of Libby Pose an Imminent and Substantial Endangerment to Public Health

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2045367

**TO:** Jim Christiansen, Remedial Project Manager  
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**I. PURPOSE**

This memorandum presents the rationale for determination of imminent and substantial endangerment to public health from asbestos contamination in various types of source materials at residential and commercial properties in and around the community of Libby, Montana. This memorandum confirms and extends similar issues and conclusions discussed in previous endangerment memoranda prepared by Dr. Chris Weis, former Science Support Coordinator, for the Libby Site (Weis, 2000; Weis, 2001a, Weis, 2001b).

**II. SUMMARY OF FINDINGS**

- 1) Asbestos fibers of the type that occur in vermiculite ore from the mine in Libby are hazardous to humans when inhaled.
- 2) Asbestos mineral fibers that are characteristic of those that occur in materials from the Libby mine are present in a variety of different source materials at residential and commercial locations in and around the community of Libby. Outdoor source materials include yard soil, garden soil, driveway material, and assorted mine waste materials, while indoor source materials include house dust and vermiculite insulation.
- 3) Disturbance of asbestos-contaminated source materials by activities similar to

those that are likely to be performed by area residents and workers can result in elevated concentrations of respirable asbestos fibers in air.

- 4) The concentrations of fibers in air generated by disturbance of source materials may exceed OSHA occupational standards (OSHA 1994) and EPA cancer risk guidelines (EPA 1986).

On this basis, it is concluded that: a) contaminated source materials at this site, such as soil and soil-like media, dust, and vermiculite insulation, contain elevated concentrations of asbestos minerals and can serve as a source of on-going release of hazardous fibers to air, b) disturbance of LA contaminated source materials will result in a complete pathway for human exposure, and c) it is necessary to reduce or eliminate pathways of exposure for residents, workers, and others who may disturb these contaminated source materials.

### III. BACKGROUND

Vermiculite was discovered in the Rainy Creek Mining District of Lincoln County, Montana, in 1916 by E.N. Alley. Alley formed the Zonolite Company and began commercial production of vermiculite in 1921. Another company, the Vermiculite and Asbestos Company (later known as the Universal Insulation Company), operated on the same deposits (BOM, 1953). W.R. Grace purchased the mining operations in 1963 and greatly increased production of vermiculite until 1990 when mining and milling of vermiculite ceased.

Vermiculite ore bodies on Zonolite Mountain contain amphibole asbestos at concentrations ranging up to nearly 100% in selected areas (Grace). Although early exploration and mining efforts by the Zonolite Company focused upon the commercial viability of fibrous amphibole deposits found on Zonolite Mountain (DOI, 1928), no commercial production of asbestos from the Libby mine is reported. During early mining operations, airborne fiber concentrations at the mine exceeded 100 fibers/cc in several job classifications (Amandus et al, 1987a). Historical airborne fiber concentrations in the residential area of Libby exceeded the present occupational Permissible Exposure Level (PEL) of 0.1 fiber/cc established by OSHA in 1994 (MRI, 1982; Eschenbach deposition). This exposure limit is recognized as being associated with significant risk (3.4 additional asbestos-related cancers per 1000 individuals as per OSHA estimates) but is the practical lower limit of detection using phase contrast microscopy (PCM) as a measurement technique (OSHA, 1994).

Residual fiber contamination from the subject facilities continues to present potential exposure to workers, residents, and visitors at these facilities, but is presently being addressed under removal authorities provided in the Comprehensive Environmental Response Compensation and Liability Act Section 104 (CERCLA or Superfund). These actions by the U.S. Environmental Protection Agency Region 8 office in Denver, CO began on November 22, 1999 and continue today. The investigative team is working closely with Local, State, and other Federal Agencies to determine the nature and extent of mineral fiber contamination throughout Libby, and to take appropriate

action to protect the health of current residents and workers.

#### **IV. ENDANGERMENT RATIONALE**

Threats to public health have been clearly demonstrated at the Libby site with regard to: 1) disease from airborne exposure to Libby Amphibole fibers, and 2) exposures resulting from disturbance of contaminated source materials.

##### **A. Disease from Exposure to Libby Amphibole Fibers**

*Exposure to airborne asbestos fibers resulting from disturbance of ore products or wastes from the Zonolite Mountain in Libby, Montana is hazardous to human health.*

The risk of developing an asbestos-related disease depends on fiber characteristics, the level and duration of exposure, time since first exposure, the individual's smoking history, and the individual's response to the presence of asbestos fibers in pulmonary tissue. In general the longer a person is exposed to asbestos and the greater the intensity of the exposure, the greater the likelihood for asbestos-related health problems. While some forms of disease, especially cancers, may take as long as forty years to develop, there is concern that even short-term exposures may have significant adverse health impacts. This is particularly true for children, in whose lungs the presence of fibers may be able to exert their toxic effects for many more years as compared to exposures during adulthood.

##### **1. Libby Site Exposures and Disease**

The health effects from airborne exposure to the more common commercially used and regulated asbestos mineral forms (chrysotile, tremolite, actinolite, anthophyllite, amosite, crocidolite) include: (1) pleural disease (plaques, diffuse thickening, calcifications, and pleural effusions), (2) interstitial disease (asbestosis), (3) lung cancer, and (4) mesothelioma (a rare cancer of mesothelial cells in the pleura or peritoneum). The observed health effects associated with exposure to asbestiform amphibole fibers (Libby Amphibole) (Meeker, 2003) at the Libby site have been well documented and are clearly consistent, and perhaps even more severe, than those illnesses seen with the more common asbestos mineral exposures (as noted below).

Studies performed in the early 1980's by researchers from McGill University (McDonald 1986a-b) and the Centers for Disease Control and Prevention (CDC), National Institute for Occupational Safety and Health (NIOSH) (Amandus 1987a-c) found that former employees of the Libby vermiculite mine had significantly increased pulmonary morbidity and mortality from asbestosis and lung malignancies. Researchers at NIOSH who studied the annual chest x-rays of mine and mill workers with at least 5 years tenure (between 1975 and 1982) also found an increased prevalence of the radiographic abnormalities associated with asbestos-related disease. A recent follow-up study of Libby vermiculite workers that were previously evaluated in the 1980's, found that "this small cohort of vermiculite miners, exposed to amphibole fibers in the tremolite series, has suffered severely from both malignant and non-malignant respiratory disease" (McDonald, 2002). The overall proportionate mortality among the group for

mesothelioma (4.2%) was extremely high, being similar to that seen for crocidolite (considered by many to be the most toxic form of asbestos) miners in South Africa (4.7%) and Australia (3.9%) (McDonald 2002, McDonald 2004). For comparison, the age-adjusted incidence of mesothelioma in the United States (1992-2002) was about 0.00001% (1 case per 100,000) with the occurrence of cases being extremely rare prior to age 50 (SEER, 2005).

More recent studies completed at the Libby site have also found increased mortality and morbidity among former workers, as well as, others in the community without any direct occupational exposures to the mine or processing activities. A mortality study conducted by investigators from the CDC, Agency for Toxic Substances and Disease Registry (ATSDR) found markedly elevated death rates of asbestosis, lung cancer, and mesothelioma for the Libby Community for the 20-year period examined (1979-1998). Mortality from asbestosis was approximately 40 times higher than the rest of Montana and 60 times higher than the rest of the United States (ATSDR 2000, ATSDR 2002a).

Large-scale medical screening of over 7300 individuals that worked or lived in Libby for at least six months prior to 1990, found significantly increased rates of asbestos-related radiologic abnormalities. Approximately 18% (1186/6668) of the participants with asbestos-related pleural abnormalities were identified by at least 2 out of 3 B-readers. The prevalence of pleural abnormalities increased with increasing exposure pathways, ranging from 6.7% for those who reported no apparent exposures to 34.6% for those who reported 12 or more exposure pathways. The majority of individuals (>70%) with pleural abnormalities did not directly work for the mine or processing operations, or with any secondary contractors for the mine (Peipins 2003, EHP 2004). Findings of asbestos-related pleural disease were also documented in a case-series involving a small group of Libby residents with no history of any occupationally-related asbestos exposures (ATSDR 2002b). In another recent study, computed tomography (CT) scans were evaluated as a screening tool for detecting asbestos-related lung abnormalities in persons who had indeterminate chest x-rays (only 1 of the 3 B-readers reported pleural abnormalities on the participant's chest x-ray) during the medical screening in Libby, Montana. These were individuals that were not counted by investigators as having "asbestos-related abnormalities" for the analysis or reporting of data from the medical screening. Of the 353 participants with indeterminate chest x-rays (55 former vermiculite mine and mill workers, 99 household contacts, 199 persons with exposure to vermiculite due to past direct recreational behaviors), CT scans detected pleural abnormalities in 98 persons or 28% of all those tested (ATSDR 2003), indicating that the actual prevalence of asbestos-related pleural disease reported in the community by Peipins et. al. (Peipins 2003), is likely to be conservative.

A recent expert review of the medical literature by the American Thoracic Society (ATS) that focused on "non-malignant asbestos disease" reported the following findings with regard to asbestos-related pleural disease: 1) slow progression of asbestos-related pleural disease is typical, with up to 85% of heavily exposed workers and 17% of environmentally exposed populations showing progression of their disease over time, 2) the presence of asbestos-related pleural disease has been associated with a greater risk of mesothelioma and lung cancer compared with subjects of comparable histories of asbestos exposures who do not have such abnormalities, and 3)

epidemiologic studies have shown a significant reduction in lung function attributable to both circumscribed and diffuse pleural fibrosis, even in the absence of radiological evidence of interstitial fibrosis (asbestosis) (ATS 2004). Such findings of disease progression and loss of pulmonary function has also been recently documented for individuals with exposure to Libby Amphibole. This study evaluated 123 patients (86 former workers, 27 family members of former workers, 10 non-occupational exposures) with exposure to Libby Amphibole for changes in pulmonary function over time. Marked progressive loss of pulmonary function was found in 94 (76%) of these patients, with the majority having predominantly only pleural disease (Whitehouse 2004).

## **2. Offsite Exposures and Disease**

In addition to the Libby site, offsite occupational exposures to Libby Amphibole associated with processed vermiculite ore and vermiculite products (having much lower levels of contamination) have also documented the extremely hazardous nature of this material. A study of 513 workers at a manufacturing plant in Marysville, Ohio that handled processed vermiculite ore found an increased prevalence of shortness of breath, pleuritic chest pain, and radiographic pleural abnormalities in association with cumulative asbestos exposures as low as 1-10 fibers/ml-year (Lockey, 1984). Preliminary results from a recent follow-up evaluation of 236 of the original Ohio workers found that the overall prevalence of pleural plaques had increased from 4% among the overall cohort in 1980 to 26.3%. The increase in pleural changes was found in both low and higher exposure categories and this increase was significantly associated with cumulative exposure ( $p < 0.05$ ). Percent of workers with pleural changes increased in relation to cumulative exposure quartiles: 1<sup>st</sup> quartile 5.1% (0.0007-0.361 fiber/cc-year), 2<sup>nd</sup> quartile 22.0% (0.362-1.042 f/cc-yr), 3<sup>rd</sup> quartile 33.9% (1.043-2.564 f/cc-yr), and 4<sup>th</sup> quartile 44.1% (2.565-28.11 f/cc-yr). The manufacturing facility had ceased using Libby vermiculite ore in 1980 and subsequently used vermiculite ore from other sources that reportedly contained no asbestos or asbestiform minerals (Rohs, 2005). Progressive disease from exposure to Libby Amphibole fibers was also noted in a case study that reported the occurrence of fatal asbestosis in an individual 50 years after working at an offsite vermiculite processing plant for a few months at about age 17 (Wright, 2002). In addition to occupational exposures, cases of fatal non-occupational asbestos disease associated with exposures to contaminated vermiculite have been reported. In one case, exposures stemming from playing for a few years as a child in contaminated vermiculite waste materials around a former Libby vermiculite processing facility was associated with the development of asbestosis and fatal lung cancer (Srebro, 1994). In another case, exposure to vermiculite attic insulation was associated with the development of fatal mesothelioma in a homeowner (Harashe v. Flintkote, 1993).

## **B. Asbestos Exposures Resulting From Contaminated Bulk Materials**

*Disturbance of soils, dusts, insulation, garden products, and other bulk materials contaminated with asbestiform minerals from Libby, Montana may result in a complete pathway for airborne human exposure. Depending on various environmental factors (e.g., room ventilation, wind, humidity) and the nature of the activities, airborne exposures may exceed available OSHA standards (OSHA 1994) and EPA health guidance (EPA 1986).*

## 1. Soils & Dust

Asbestos fibers in soil or dust are not inherently hazardous to humans if left undisturbed. However, most soils and dusts are subject to disturbance, either now or in the future, by many different types of activities that are common for residents or workers. The presence of LA contaminated exterior soils and interior dusts poses an exposure hazard for individuals, such as workers, who may frequent and disturb such materials on a routine basis. Asbestos contaminated source materials, such as surface soils, may also serve as an ongoing reservoir for fiber emission and contamination into co-located indoor environments or vehicles, through air currents or transport via human activity (i.e., soil adherence to shoes). Once contaminated, such areas or vehicles can then in-turn serve as secondary sources of ongoing human exposure.

Ongoing EPA investigations at the Libby site have demonstrated that mechanical disturbance of asbestos-contaminated soil or dust by activities similar to those that are likely to be performed by area residents or workers results in elevated levels of respirable asbestos fibers in air. EPA Region 8 evaluated several scenarios involving disturbance of contaminated soils and dusts such as vehicular traffic on Rainy Creek Road, active cleaning of households, sweeping of dust, and rototilling of soil. These scenarios clearly demonstrated that asbestos fibers may be released into the personal breathing zones by a variety of common activities and that a complete pathway exists by which asbestos-contaminated source materials may cause inhalation exposure of area residents and workers. Additionally, EPA found that the concentrations of fibers in air generated by disturbance of source materials may exceed OSHA standards for acceptable occupational exposure, as well as, exceeding EPA's typical excess cancer risk range (1E-04 to 1E-06) by an order of magnitude or more. (Weis, 2001a, Weis, 2001b).

In addition to the Libby site, investigations by Region 8 researchers found that surface soils containing "trace" concentrations (<1 %) of LA by polarized light microscopy (PLM) when disturbed by raking and mechanical blowing scenarios, resulted in airborne asbestos exposures easily approaching, and in one sample exceeding the OSHA PEL (Miller, 2004). These findings are consistent with the results of EPA investigations at other sites, as well as, evaluations performed by other government agencies and researchers. For example, disturbance scenarios simulating baseball, basketball, soccer, bike riding, running, playing on a children's playground, and gardening in low concentration asbestos contaminated soils (<1%) in El Dorado Hills, California, found complete exposure pathways and significantly elevated airborne exposures (EPA Region 9, 2005). Published research performed by Addison et. al. (Addison, 1988) showed that even soils containing asbestos concentrations as low as 0.001% can generate elevated airborne concentrations when disturbed. Currently EPA has not established an asbestos level in soil or dust below which an exposure does not pose a risk, under any of its regulatory programs. The 1% asbestos concentration levels commonly cited and used for regulatory purposes under the EPA Toxic Substances Control Act (TSCA) abatement program, was established on the basis of analytical capability at the time and does not have any relationship to the actual health risks associated with the handling or disturbance of the contaminated material in question. Based on increased recognition of this issue and advancement of the science, California EPA is currently in the process of adopting new guidance for asbestos contaminated soils at schools which suggests that soils containing asbestos concentrations greater than or equal

to 0.001% asbestos by weight may need to be remediated, especially in high use areas such as playing fields and dirt roads (Cal/EPA, 2004). *implies they are "further along"*

## **2. Libby Vermiculite Products**

Disturbance of vermiculite products (e.g., vermiculite insulation, vermiculite garden products) originating from the Libby mine can result in elevated levels of respirable asbestos fibers in the air. Activities similar to those likely to be performed by homeowners and workers that disturb vermiculite products containing even trace amounts or non-detectable concentrations of asbestos by PLM methods, have been demonstrated to release airborne concentrations of fibers which can exceed OSHA and EPA guidelines (Grace 1976a, 1976b, 1977; Versar, 2002; EPA Region 10, 2000). Recognition of this finding has resulted in national warnings by EPA, ATSDR, and NIOSH concerning the dangerous nature of vermiculite insulation used in residences and businesses throughout the United States (EPA & ATSDR, 2003; NIOSH Fact Sheet 2003).

## **V. CONCLUSIONS**

The rationale for determination of imminent and substantial endangerment from asbestos-contaminated source materials in residential areas of Libby is four-fold:

- 1) Asbestos fibers from the Libby mine site are hazardous to humans as evidenced by the occurrence of asbestos-related disease in area residents and workers. Workers and area residents exposed to asbestos fibers from the Libby mine site have been found to have increased mortality and morbidity from asbestos-related conditions, including asbestosis, pleural fibrosis, lung cancer, and mesothelioma. Asbestos-related lung diseases have also been observed in area residents with no direct occupational exposures, including family members of mine workers, and even in those with no known association with the vermiculite mining or processing activities;
- 2) Asbestos fibers can be detected in several types of source materials (yard soil, garden soil, driveway material, waste piles, indoor dust, vermiculite insulation) at multiple locations in and around the residential and commercial areas of Libby. These contaminated materials constitute a potential source of asbestos exposure to workers and area residents;
- 3) Asbestos fibers in contaminated source materials may be released into air by a variety of activities similar to those that area residents or workers may engage in under normal living conditions. This demonstrates that a complete exposure pathway exists by which asbestos-contaminated source materials may result in airborne exposures of area residents or workers;
- 4) The concentrations of asbestos fibers that occur in air following mechanical disturbance of source materials may reach levels of potential human health concern, as

evidenced by airborne concentrations which can exceed OSHA occupational standards and EPA cancer risk guidelines. Furthermore, given the mineralogic and morphologic characteristics of Libby Amphibole fiber it is likely that the EPA cancer risk guidance may underestimate actual cancer risks for this population.

Asbestos contamination exists in a number of potential source materials at multiple locations in and around the residential and commercial areas of Libby. These potential source materials include area soils (yards, gardens, playgrounds, etc.), driveway material, waste piles, indoor dust, and vermiculite insulation. If these contaminated sources are disturbed by human activities, fibers are likely to be released to air. Chronic, and even higher dose short-term, exposures to airborne LA fibers pose an increased risk for asbestos-related lung diseases. Sampling events involving contaminated source materials at the Libby site, and even at offsite vermiculite processing facilities, consistently indicate the presence of amphibole asbestos which can result in airborne exposures of concern. The concentration levels released to air depend on the concentration of fibers in the source material and on the nature of the disturbance. Risks are proportional to the concentration of fibers in air and the frequency and duration of exposure. While data are not yet sufficient to perform reliable human-health risk evaluations for all sources and all types of disturbance, it is apparent that releases of fiber concentrations higher than OSHA standards may occur in some cases (mainly those associated with active disturbance of vermiculite), and that screening-level estimates of lifetime excess cancer risk can exceed the risk range of  $1E-04$  usually used by EPA for residents and naïve work populations. The occurrence of such high levels of non-occupational asbestos-related disease among Libby residents is extremely unusual, suggesting that a combination of factors related to elevated or prolonged environmental exposures and/or increased toxicity of this form of amphibole asbestos may be involved. On this basis, I recommend that steps be taken to further identify, quantify, minimize and/or eliminate pathways of human exposure to amphibole asbestos in the residential and commercial areas of Libby.

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Jim's comments and thoughts on Endangerment Memo dated 6/20/2005

Page 4, 2<sup>nd</sup> full paragraph. "no apparent exposures" Suggest: "...ranging from 6.7% for those who reported no apparent exposures (other than living in Libby), to 34.6% for those..."

Page 6, 3<sup>rd</sup> paragraph, first sentence. Suggest we remove "trace." You are referring to <1% soils as "trace" That is a little inconsistent with our normal nomenclature, in which "trace" refers to detects that are not quantifiable (e.g. <0.1%-0.2%). Just for consistency.

Page 6, 3<sup>rd</sup> paragraph. Starting with "Published research performed by..." None of my comments on this section were addressed. I suggest:

- Addison. I suggest: "While the disturbances were conducted under highly controlled laboratory conditions and may not be representative of real-world exposures, published research performed by Addison showed that soils containing asbestos concentrations as low as .001% can generate elevated airborne concentrations when disturbed within an enclosed environment." Or "Published research performed by Addison showed that soils containing asbestos concentrations as low as .001%, when disturbed within a small, enclosed box, can generate significantly elevated airborne concentrations. While these results may not be suitable for making direct correlations to real-world exposures, they nonetheless demonstrate the potential for elevated air concentrations when contaminated soils are disturbed."
- "EPA has not established an asbestos level..." I suggest: "Similar to all carcinogens, EPA has not established an asbestos level in soil or dust below which an exposure does not pose any risk. However, the EPA Superfund Program does have approved models and guidelines for predicting and managing risks from asbestos. The science and regulatory framework that supports these tools is considered by many to be somewhat outdated and several efforts are underway to review and improve the science. The Superfund Program's current position (Cook memo) is that the commonly cited 1% concentration level (used to regulate asbestos abatements under the Toxic Substance Control Act and many State programs) is not health-based, and that Superfund sites containing soils or materials with <1% asbestos should develop site-specific risk estimates and action levels to determine if response is warranted."
- California Schools. I suggest "Based upon increased recognition of the problems associated with asbestos in soils and dusts, California EPA is currently in the process of adopting new guidance for asbestos contaminated soils at schools which suggests that soils containing asbestos concentrations greater than or equal to .001% by weight may need to be remediated, especially in high use areas such as playing fields and dirt roads. While this guidance is not based upon a site-specific risk assessment and may be difficult to implement, it nonetheless shows that, based upon the current state of science, California is extremely concerned about the problems associated with low concentrations of asbestos in soils and has elected to take an aggressive regulatory stance with regard to schools."



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8

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Ref: 8EPR-SR

**ACTION MEMORANDUM AMENDMENT**

**SUBJECT:** Action Memorandum Amendment for the Time-Critical Removal Action at the Libby Asbestos Site – Libby, Lincoln County, Montana.

**FROM:** Robert E. Roberts  
Regional Administrator

**TO:** Thomas P. Dunne  
Acting Assistant Administrator  
Office of Solid Waste and Emergency Response

**THROUGH:** Michael B. Cook, Director  
Office of Emergency and Remedial Response

Site ID#: BC  
Category of Removal: Time Critical, NPL, EPA Fund-Lead

**I. INTRODUCTION**

The purpose of this Action Memorandum Amendment is to: (1) request and document Headquarters approval of a ceiling increase for the Libby Asbestos Site (Site) in Lincoln County, Montana, and (2) request and document a consistency exemption from the \$2 million and one year limits on Removal Actions as described in National Contingency Plan (NCP) Section 300.415(b)(2). The previous Action Memorandum Amendment dated May 2, 2002 set forth the need and scope for additional cleanup activities at the Site. Those cleanup activities are progressing and are still considered to be of emergency nature. However, the difficulty and expense of cleanup is greater than anticipated and additional removal ceiling is required to continue the necessary emergency response actions. EPA Region 8 (Region 8) continues to conduct cleanup while concurrently completing necessary investigation and working toward publication of a Record of Decision (ROD). *a remedial?*

*⊕ both exemptions*

**II. SITE CONDITIONS AND BACKGROUND**

**A. Site Description**

The initial Action Memorandum and subsequent Amendments provide basic descriptions of the vermiculite mine, vermiculite processing facilities, several contaminated properties, and the conditions found throughout the Libby Valley. Since the date of the previous Action Memorandum Amendment (May 2002), the Site became final on the National Priorities List (NPL) in October 2002. Additional investigation has focused on two major aspects: (1) evaluating conditions at individual residential and commercial properties throughout Libby as necessary to implement the response actions set forth in May 2002, and (2) collecting data necessary to complete a Remedial Investigation/Feasibility Study (RI/FS) and publish a ROD. While the total number of properties requiring ~~remediation~~ <sup>a response action</sup> will remain uncertain until a ROD is published, Region 8 currently estimates that approximately 1400 residential/commercial properties will require ~~remediation~~ <sup>response</sup>. This is significantly higher than estimates presented in the May 2002 Action Memorandum Amendment. Approximately 350 properties have been completed to date.

#### B. Other Actions to Date

The previous Action Memorandum Amendment provided a description of various activities at the Site and their progress as of May 2002. These activities were completed or continued as necessary and additional activities were started. For activities or locations that were NOT completed as of May 2002, an updated summary is found below:

PREVIOUS ACTIONS	
Location	Action Description and Updated Status
Export Plant	W.R. Grace demolished and disposed of four buildings on the property and removed approximately 17,500 cubic yards of contaminated soil and debris from the property. Region 8 completed remaining demolition work at the property of one building in 2002. The lumber business formerly operating at this location was relocated by EPA and Grace in 2003 to a new location in Libby. Work here is complete.

③ - pagination?

Screening Plant	This property consists of five distinct, contiguous parcels. (1) <b>Raintree Nursery.</b> Region 8 completed cleanup of this parcel in 2003. Approximately 17 acres were addressed and 250,000 cubic yards of contaminated debris and soil were removed. Restoration of this parcel is essentially complete, with only punch-list items remaining for 2005. (2) <b>North Side Parker Property.</b> Region 8 completed cleanup here in 2004, addressing approximately four additional acres. (3) <b>Flyway Property.</b> Region 8 completed approximately ¼ of the cleanup of the Flyway parcel in 2002; W.R. Grace cleaned up the remainder of the parcel in 2004. In all, approximately sixteen acres were addressed and approximately 50,000 cubic yards of soil were removed. (4) <b>KDC Bluffs Property.</b> Several areas of the KDC Bluffs parcel were cleaned up by EPA in 2001; some lower level contamination remains which will be evaluated for future Remedial Actions. (5) <b>Wise Property.</b> Small property between Raintree Nursery and the Flyway that still requires cleanup. The only extensive removal work remaining consists of the Wise property and some right of way along Highway 37 near the Flyway. This work is scheduled to occur in 2005.
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Siefke Property	Highly contaminated, large residential property identified early. Cleanup was completed in 2002 and restoration was completed in 2004. <i>for remediation</i>
Johnson, Sanderson, Temple, Struck, Rice, Fuhlendorf, Spencer, and Westfall properties.	Highly contaminated residential properties identified early. All cleanup and restoration was completed by 2003.
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take out

part of \$8M?

Lincoln County Landfill Asbestos Cell	Region 8 constructed and operates a new cell at the Lincoln County Landfill that is used for disposal of vermiculite insulation and other construction debris. Construction of the cell was completed in 2003. The cell was expanded in 2004. Disposal operations are ongoing.
Burlington Northern Santa Fe Rail Yard	BNSF began cleanup of the contaminated rail yard in 2003 but had to cease work due to complexities with soil removal below the tracks. Work began again in 2004, most tracks were removed, and work is now complete. Most contaminated soils were removed, but some contamination was capped in place.
Former Stimson Lumber Mill	Region 8 conducted extensive sampling of the former lumber mill and has identified two primary areas requiring cleanup. The first of these, the former central maintenance building, is scheduled to be cleaned up in 2005. The second, a former nursery area, was fenced off in 2004 and is to be further investigated in 2005.
Systematic screening and cleanup of individual residential and commercial properties in Libby Valley	As the first phase of the Remedial Investigation (RI), and to gather the information required to make decisions on which properties require emergency response action, Region 8 inspected and sampled approximately 3500 properties in 2002, 2003, and 2004. Most inspection is complete, though additional RI sampling is planned for 2005. As of December, 2004, approximately 350 emergency properties have been cleaned up. Work is ongoing.
Troy, MT	Nearby smaller town suspected of containing similar contamination to Libby, although generally smaller in scope. The Montana Department of Environmental Quality and EPA have signed a cooperative agreement which calls for MDEQ to conduct screening of individual properties in 2006. Background work will begin in 2005.

not grade

school?

### C. Current Actions

Region 8 is continuing systematic investigation and cleanup of individual properties throughout the Libby area described in the May 2002 Action Memorandum Amendment. There are multiple objectives to the investigation: (1) identify properties that meet criteria for emergency response and require immediate cleanup, (2) collect information and data necessary to complete an RI/FS, Baseline Risk Assessment, and ROD, and (3) identify properties that may require future Remedial Action based upon criteria that will be set forth in the ROD.

Based on current knowledge, Region 8 *estimates* that at least 1400 residential/commercial properties will require cleanup, of which approximately 1100 remain (350 emergency response properties were cleaned up through 2004 and approximately 170-200 are planned for 2005). The 1400+ figure includes properties that meet criteria for emergency response as well as estimates of the number of properties that may meet future criteria established for Remedial Action. While a large percentage of properties remaining to be cleaned up have conditions justifying emergency

*in same  
expedited  
schedule*

response, cleanup of these properties using Removal authority will generally continue only until publication of ROD, at which time cleanup will continue using Remedial authority. Remedial authority will then be used to clean up *both* classifications of properties: those that meet emergency response criteria but are not yet complete, and those that may meet future criteria established for Remedial Action. (Note that EPA may encounter situations in the future for which Removal Actions are appropriate, even after a ROD is published). Region 8 expects to publish a ROD for residential/commercial cleanup (Operable Units 00 and 04) in late 2005 or early 2006. The ROD will establish final cleanup levels and criteria which will enable REGION 8 to more accurately quantify the total number of properties requiring cleanup.

Region 8 has made significant progress toward a ROD despite ~~limited funding~~ ~~beyond what is necessary for emergency response cleanup~~ and the extremely complex nature of asbestos analysis and risk assessment. A few critical activities are highlighted below:

- In 2002, 2003, and 2004, Region 8 inspected and sampled approximately 3500 properties in the Libby area. We inspected for vermiculite insulation, visible vermiculite in soils, and collected soil and dust samples. Because contamination was generally placed at particular properties through human activities, rather than being spread uniformly by air or water, there was no clear pattern to the contamination. This warranted that each property in Libby be inspected. The information collected was used to determine which properties warranted emergency response and for defining the nature and extent of contamination across the Site.
- In 2002 and 2003, Region 8 designed and began conducting a Performance Evaluation (PE) Study to test the efficacy of existing and new analytical procedures for measuring asbestos in soil. Existing analytical methods are often not cost effective and are generally unable to detect asbestos in soil at levels that are likely of health concern. The PE Study was extremely complex, primarily because some methods had to be modified and developed specifically for Libby and there were no existing "standards" to test the any methods against. Most of the PE Study is complete and a cost-effective, new analytical method tailored to Libby was used to analyze over 12,000 soil samples collected in residential yards.
- In 2003, Region 8 published the Draft Final Action Level and Clearance Criteria Technical Memorandum, which set forth the first comprehensive screening level risk assessment calculations for Libby and the criteria for determining if a property warrants emergency response cleanup.
- In 2002, 2003, and 2004 Region 8 has worked extensively with EPA Headquarters and other EPA Regions in reviewing and updating the IRIS asbestos risk model. Developing and adopting a more accurate and accepted risk model is necessary for completion of a credible Baseline Risk Assessment in Libby.
- In 2004, Region 8 designed and conducted a post-cleanup sampling program to test the efficacy of the residential/commercial cleanup approach. This data is critical to development of final cleanup levels and protocol.
- In 2005, Region 8 plans to conduct sampling to fill in remaining data gaps, focusing on low concentration exposures that will likely be the subject of future Remedial

*peer  
reviewed  
& tested*

## **Actions.**

### **D. State, Local, and Other Authorities Roles**

There are no significant changes in roles from the May 2002 Amendment, other than the Montana Department of Environmental Quality assuming the lead role for the investigation and screening of Troy, MT.

### **III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES**

Despite significant progress on cleanup, conditions in Libby still present significant threats to public health. At least two conditions set forth in the NCP Section 300.415(b)(2) for determining the appropriateness of a removal action continue to be present in the Libby area:

**(i). Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants and contaminants.**

Sources of Libby asbestos are still found throughout the community. These source materials, when disturbed, have the potential to release asbestos to the air. Investigations have shown that approximately 1400 properties in Libby, approximately 1/3 of all properties in the area, contain some type of potential contamination source, such as vermiculite insulation or potentially contaminated soils. Actual exposure to these materials occurs daily.

- Investigations have clearly shown elevated levels of Libby asbestos in the dust of resident's homes. This dust contamination comes from several sources including but not necessarily limited to: contaminated soil at the property that is tracked into the home; contamination that was picked up at former vermiculite processing facilities in the past and brought home on clothes and equipment; releases of vermiculite insulation from the attic or walls. Residents are exposed to this dust daily, often at levels that Region 8 screening level risk calculations suggest will cause a significantly elevated cancer risk.

*add non-cancer.*

**(iv). High levels of hazardous substances or pollutants and contaminants in soils largely at or near the surface, that may migrate.**

- Soil contamination is prevalent throughout the Libby area. Region 8 has focused resources on cleaning up areas that were most highly contaminated, but many residential yards still contain ~~visible vermiculite~~ and/or measurable concentrations of Libby asbestos at or near the surface. These soils, if unaddressed, can cause direct exposure when disturbed through normal activities and can contaminate the indoor dust of homes. Screening level risk calculations by Region 8 suggest that the contamination of indoor dust by outdoor soils is one of the most important exposure pathways in Libby.

While most of the larger contaminant sources and public areas (such as former vermiculite processing plants, schools, and ball fields) have already been cleaned up, Region 8 has discovered several new "public" areas of contamination in Libby as well. These include J. Neils Park, Riverside Park and Boat Ramp, the public golf course, the public compost pile at the county landfill, and others. Some of these, such as Riverside Park, presented immediate, unacceptable risks and were cleaned up quickly. Others, due to lower contamination levels or less likelihood of exposures, have been isolated and/or earmarked for possible future Remedial Action.

#### IV. ENDANGERMENT DETERMINATION

The actual or threatened releases from this Site, if not addressed by continuing to implement the response actions set forth in the original Action Memorandum and subsequent Amendments, may present an imminent and substantial endangerment to public health, welfare, or the environment. *AR*

#### V. EXEMPTION FROM STATUTORY LIMITS

The original Libby Action Memorandum dated May 23, 2002 provided the documentation required to meet the NCP Section 300.415(b)(2) criteria for a Removal Action and the NCP Section 300.415(b)(5)(i) emergency exemption from the \$2 million and one year limits on Removal Actions. The most recent Action Memorandum Amendment dated May 2002 expanded the scope of Removal Actions and raised the approved removal ceiling to \$55,635,000. The conditions necessitating Removal Actions and the emergency exemption still exist. The difficulty and costs of mitigating these conditions have proven higher than originally estimated. Region 8 is requesting an additional increase to the removal ceiling in order to continue and complete work approved in the May 2002 Amendment.

*formerly* Removal Actions being conducted in Libby are also expected to be consistent with future Remedial Actions, and thus meet the criteria for a consistency exemption from the \$2 million and one year limits on Removal Actions as set forth in the NCP Section 300.415(b)(5)(ii). There are several reasons for this:

- ate why it is in emergency* • Libby Asbestos, the contaminant of concern in Libby, is a naturally occurring mineral. There are no known treatment technologies that can diminish or reduce the toxicity of asbestos. To address exposures from asbestos, the only cleanup options available are to remove it or to contain it. For Removal Actions at the Site, Region 8 has used a combination of both as appropriate.
- Because asbestos use was widespread in the past, asbestos abatement is well understood. There are a limited number of options available for cleanup. Most importantly, when asbestos is determined to be friable, the preferred mechanism to address potential exposures is to remove the source. [REDACTED]

- Investigations have shown that sources of Libby Asbestos, including, but not limited to, contaminated soil, vermiculite insulation, and vermiculite processing wastes, are prevalent throughout Libby. Past investigations have clearly shown that, when disturbed, these sources can release asbestos to the air and have the potential to contaminate indoor dust. The primary objective of the Removal Actions in Libby is to remove or isolate these sources. Any future Remedial Actions must also employ source removal as a key component of cleanup and response.
- Various cleanup techniques were evaluated during the initial emergency response cleanups of residential/commercial properties. While the basic options are limited, exactly how, when, and to what degree each option is applied is less straightforward. Region 8 used this experience to evaluate the efficacy of various approaches and to refine our cleanup strategy. This information will be used in the RI/FS. ~~We continue to look for ways to ensure the cleanup is cost effective.~~
- Because a Baseline Risk Assessment and ROD are not yet complete, there exists some uncertainty as to (1) which properties with "lower" levels of contamination will require cleanup and (2) how protective each cleanup should be. However, to ensure that Removal Actions are protective and consistent with future Remedial Actions, Region 8 has taken a conservative approach and adopted protocols that help ensure we will not have to clean up a property twice. In general, we only start cleanup if a property has conditions that warrant emergency response, but once a cleanup occurs, we remediate to a level expected to be protective for the long-term. Post-cleanup sampling has validated the efficacy and protectiveness of the cleanups. This approach ensures the worst risks are addressed first and is cost-effective, protective, and well accepted by the community and the State of Montana.

## VI. PROPOSED ACTIONS AND ESTIMATED COSTS

### A. Proposed Action Description

The Action Memorandum Amendment dated May 2002 set forth the proposed actions. Other than increased numbers of properties likely requiring cleanup, and increased difficulties of conducting the actions, the scope has not changed.

### B. Contribution to remedial performance

The Site was made final on the NPL in October 2002. While cleanup at the Site continues to be conducted using removal authority, the Site was transitioned to the Region 8 Remedial Program in directly after final listing on the NPL. Collection of information and data necessary to perform an RI, and ultimately to write a Record of Decision, is occurring concurrently with the conduct of the Removal Actions. Information and experience gained during the removal actions is used to continually refine the process and to plan for future work. Likewise, as more information is learned about the nature of the contamination and the risks presented, adjustments to the cleanup approach are made as necessary. ~~Wherever possible~~, effort is made to focus on the most contaminated properties first and also to ensure that properties are cleaned to a

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sufficient level such that cleanup must occur only once. This approach is protective as well as cost effective. As described in Section V of this Amendment, it is expected that the cleanup approaches used during Remedial Actions will be similar to, and consistent with, those used during Removal Actions.

#### C. Description of alternative technologies

EPA attempts to employ the most appropriate technologies for addressing risks, but there are no known alternative technologies available at this time for addressing asbestos. Cleanup occurs through the systematic use of several existing technologies, including removal, containment, and encapsulation. Wherever necessary and possible, Region 8 considers unique applications of these technologies to meet site-specific cleanup objectives.

#### D. EE/CA

No EE/CA is required.

#### E. Applicable or relevant and appropriate requirements

See the Federal and State ARARs identified and/or discussed in the original Action Memorandum dated May 23, 2000.

#### F. Project Schedule

The total number of properties requiring cleaned up will not be known until publication of a ROD, expected in late 2005 or early 2006. Based on current knowledge, Region 8 estimates that approximately 1400 properties will require cleanup, of which 350 have already been addressed. While a large percentage of remaining properties will meet the conditions set forth in the May 2002 Action Memo Amendment for emergency response, emergency response cleanup using removal authority will continue only until publication of a ROD, at which time cleanup will continue using remedial authority. Remedial authority will then be used to clean up both classifications of properties: those that meet emergency response criteria but are not yet complete, and those that may meet future criteria established for remedial action. (Note that EPA may encounter situations in the future for which removal actions are appropriate, even after a ROD is published). REGION 8 expects that approximately 170-200 properties can be cleaned up per year at current funding levels. The overall project schedule is contingent upon funding and the total number of properties requiring cleanup, but based on current knowledge, the current funding situation, and the actual date of a ROD, Region 8 estimates that approximately 1-2 years of emergency response and 4-6 years of Remedial Actions remain. 170-200 properties are scheduled to be completed in 2005.

#### G. Estimated Costs

The ceiling increase is projected to cover two years of additional Removal Actions at

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production rates similar to those in 2003 and 2004 (170-200 properties expected to be cleaned per year). While the scope of cleanup has not fundamentally changed, the May 2002 Action Memorandum Amendment significantly underestimated the average cleanup cost per property, and the amount of oversight and management required, did not accurately account for disposal costs, and underestimated the number of properties requiring cleanup. Because of this, Region 8 has reached the removal ceiling <sup>spent funds faster</sup> quicker than anticipated and the job is not complete. However, after two years of investigation and cleanup, Region 8 is able to more accurately forecast cleanup requirements, both on a per property basis and overall. Because of this increased accuracy, and for simplicity, this Amendment provides only a basic, cumulative breakout of existing and proposed removal ceilings (Table 1), as well as a summary of other external costs that have been incurred that do not count against the removal ceiling (Table 2). Again, it is expected a ROD will be published within two years, and cleanup will switch to remedial authority as necessary.

- difficulty of  
interior cleanups

DRAFT

Table 1. Proposed Site Ceiling

Category	Current Ceiling (Action Memo Amendment dated May 2, 2002)	Proposed Ceiling Increase	Proposed Total
Extramural Costs	\$45,525,000	\$30,000,000	\$75,525,000
Contingency @ 20% of Extramural	\$9,100,000	\$6,000,000	\$15,100,000
Intramural Costs	\$960,000	\$100,000	\$1,060,000
<b>TOTAL</b>	<b>\$55,635,000</b>	<b>\$36,100,000</b>	<b>\$91,735,000</b>

Table 2. Other major expenditures not counted against ceiling. Note that amounts are approximate.

Task	Previous Expenditures Through CY 2004 (approximate)	Planned Expenditure CY 2005-2006 (approximate)
Phase I and Phase II Removal Sampling Investigations	\$8,100,000	0
Medical Screening Support	\$500,000	0
Contaminant Screening Study (first phase of Remedial Investigation)	\$5,000,000	\$500,000
Remedial Investigation & Risk Assessment	\$2,500,000	\$1,500,000
Performance Evaluation/ Analytical Methods Study	\$1,000,000	\$200,000
USGS Support	\$2,000,000	0
Community Involvement	\$500,000	\$500,000
Database Creation and Management	\$2,000,000	\$1,500,000
<b>TOTAL</b>	<b>\$21,600,000.00</b>	<b>\$4,200,000.00</b>

## **VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

Delayed action will result in continued public exposure to unsafe amounts of amphibole asbestos. This will increase the risk to public health and continue to burden an already impacted community.

## **VIII. OUTSTANDING POLICY ISSUES**

There are no new policy issues or considerations.

## **IX. ENFORCEMENT**

A confidential summary of Enforcement Actions is included as a separate document.

## **X. RECOMMENDATION**

This decision document represents the selected Removal Action for the removal of asbestos sources from targeted homes, businesses, and public buildings at the Libby Asbestos Site in Lincoln County, Montana. The proposed removal actions have been developed in accordance with CERCLA as amended and are consistent with the NCP. The decision is based on the Administrative Record for the Site.

Conditions at the Site meet the NCP [40 CFR § 300.415(b)] criteria for a Removal Action, and the NCP [40 CFR § 300.415(b)(5)(i)] and [40 CFR § 300.415(b)(5)(ii)] criteria for an exemption from the statutory limits. I recommend your approval of the proposed Removal Action ceiling increase.

Approve: \_\_\_\_\_ Date: \_\_\_\_\_

Thomas P. Dunne  
Acting Assistant Administrator  
Office of Solid Waste and Emergency Response

Disapprove: \_\_\_\_\_ Date: \_\_\_\_\_

Thomas P. Dunne  
Acting Assistant Administrator  
Office of Solid Waste and Emergency Response

DECLASSIFIED



Record?

Attorney Work Product  
Attorney Client Communication  
Privileged?



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Regional Administrator

**TO:** Thomas P. Dunne  
Acting Assistant Administrator  
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**THROUGH:** Michael B. Cook, Director  
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Category of Removal: Time Critical, NPL, EPA Fund-Lead

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Should we  
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solely  
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p. 8

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-very good!

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do you want them to be it's party.

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Burlington Northern Santa Fe Rail Yard	BNSF began cleanup of the contaminated rail yard in 2003 but had to cease work due to complexities with soil removal below the tracks. Work began again in 2004, most tracks were removed, and work is now complete. Most contaminated soils were removed, but some contamination was capped in place. — ICS?
Former Stimson Lumber Mill	Region 8 conducted extensive sampling of the former lumber mill and has identified two primary areas requiring cleanup. The first of these, the former central maintenance building, is scheduled to be cleaned up in 2005. The second, a former nursery area, was fenced off in 2004 and is to be further investigated in 2005.
Systematic screening and cleanup of individual residential and commercial properties in Libby Valley	As the first phase of the Remedial Investigation (RI), and to gather the information required to make decisions on which properties require emergency response action, Region 8 inspected and sampled approximately 3500 properties in 2002, 2003, and 2004. Most inspection is complete, though additional RI sampling is planned for 2005. As of December, 2004, approximately 350 emergency properties have been cleaned up. Work is ongoing.
Troy, MT	Nearby smaller town suspected of containing similar contamination to Libby, although generally smaller in scope. The Montana Department of Environmental Quality and EPA have signed a cooperative agreement which calls for MDEQ to conduct screening of individual properties in 2006. Background work will begin in 2005.

by who, under RC?

why not remediate?

Not part of this removal or its funding

### C. Current Actions

Region 8 is continuing systematic investigation and cleanup of individual properties throughout the Libby area described in the May 2002 Action Memorandum Amendment. There are multiple objectives to the investigation: (1) identify properties that meet criteria for emergency response and require immediate cleanup, (2) collect information and data necessary to complete an RI/FS, Baseline Risk Assessment, and ROD, and (3) identify properties that may require future Remedial Action based upon criteria that will be set forth in the ROD.

Based on current knowledge, Region 8 estimates that at least 1400 residential/commercial properties will require cleanup, of which approximately 1100 remain (350 emergency response properties were cleaned up through 2004 and approximately 170-200 are planned for 2005). The 1400+ figure includes properties that meet criteria for emergency response as well as estimates of the number of properties that may meet future criteria established for Remedial Action. While a large percentage of properties remaining to be cleaned up have conditions justifying emergency

response, cleanup of these properties using Removal authority will generally continue only until publication of ROD, at which time cleanup will continue using Remedial authority. Remedial authority will then be used to clean up ~~both classifications of properties~~ <sup>on the same expedited schedule.</sup> those that meet emergency response criteria but are not yet complete, and those that may meet future criteria established for Remedial Action. (Note that EPA may encounter situations in the future for which Removal Actions are appropriate, even after a ROD is published). Region 8 expects to publish a ROD for residential/commercial cleanup (Operable Units 00 and 04) in late 2005 or early 2006. The ROD will establish final cleanup levels and criteria which will enable REGION 8 to more accurately quantify the total number of properties requiring cleanup.

Region 8 has made significant progress toward a ROD despite both limited funding ~~beyond what is necessary for emergency response cleanup~~ and the extremely complex nature of asbestos analysis and risk assessment. A few critical activities are highlighted below:

- In 2002, 2003, and 2004, Region 8 inspected and sampled approximately 3500 properties in the Libby area. We inspected for vermiculite insulation, visible vermiculite in soils, and collected soil and dust samples. Because contamination was generally placed at particular properties through human activities, rather than being spread uniformly by air or water, there was no clear pattern to the contamination. This warranted that each property in Libby be inspected. The information collected was used to determine which properties warranted emergency response and for defining the nature and extent of contamination across the Site.
- In 2002 and 2003, Region 8 designed and began conducting a Performance Evaluation (PE) Study to test the efficacy of existing and new analytical procedures for measuring asbestos in soil. Existing analytical methods are often not cost effective and are generally unable to detect asbestos in soil at levels that are likely of health concern. The PE Study was extremely complex, primarily because some methods had to be modified and developed specifically for Libby and there were no existing "standards" to test the ~~any~~ methods against. <sup>peer reviewed & tested</sup> Most of the PE Study is complete and a cost-effective, new analytical method tailored to Libby was used to analyze over 12,000 soil samples collected in residential yards.
- In 2003, Region 8 published the Draft Final Action Level and Clearance Criteria Technical Memorandum, which set forth the first comprehensive screening level risk assessment calculations for Libby and the criteria for determining if a property warrants emergency response cleanup.
- In 2002, 2003, and 2004 Region 8 has worked extensively with EPA Headquarters and other EPA Regions in reviewing and updating the IRIS asbestos risk model. Developing and adopting a more accurate and accepted risk model is necessary for completion of a credible Baseline Risk Assessment in Libby.
- In 2004, Region 8 designed and conducted a post-cleanup sampling program to test the efficacy of the residential/commercial cleanup approach. This data is critical to development of final cleanup levels and protocol.
- In 2005, Region 8 plans to conduct sampling to fill in remaining data gaps, focusing on low concentration exposures that will likely be the subject of future Remedial

## **Actions.**

### **D. State, Local, and Other Authorities Roles**

There are no significant changes in roles from the May 2002 Amendment, other than the Montana Department of Environmental Quality assuming the lead role for the investigation and screening of Troy, MT.

### **III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES**

Despite significant progress on cleanup, conditions in Libby still present significant threats to public health. At least two conditions set forth in the ~~NCP~~ <sup>of the NCP</sup> Section 300.415(b)(2) for determining the appropriateness of a removal action continue to be present in the Libby area:

#### **(i). Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants and contaminants.**

Sources of Libby asbestos are still found throughout the community. These source materials, when disturbed, have the potential to release asbestos to the air. Investigations have shown that approximately 1400 properties in Libby, approximately 1/3 of all properties in the area, contain some type of potential contamination source, such as vermiculite insulation or potentially contaminated soils. Actual exposure to these materials occurs daily. *Fire*

- Investigations have clearly shown elevated levels of Libby asbestos in the dust of residents' homes. This dust contamination comes from several sources, including, but not necessarily limited to: contaminated soil at the property that is tracked into the home; contamination that was picked up at former vermiculite processing facilities in the past and brought home on clothes and equipment; releases of vermiculite insulation from the attic or walls. Residents are exposed to this dust daily, often at levels that Region 8 screening level risk calculations suggest will cause a significantly elevated cancer risk.

*what about non-cancer risk?*

#### **(iv). High levels of hazardous substances or pollutants and contaminants in soils largely at or near the surface, that may migrate.**

- Soil contamination is prevalent throughout the Libby area. Region 8 has focused resources on cleaning up areas that were most highly contaminated, but many residential yards still contain visible vermiculite and/or measurable concentrations of Libby asbestos at or near the surface. These soils, if unaddressed, can cause direct exposure when disturbed through normal activities and can contaminate the <sup>interior</sup> indoor dust of homes with asbestos dust. Screening level risk calculations by Region 8 suggest that the contamination of indoor dust by outdoor soils is one of the most important exposure pathways in Libby.

*Need better explanation about why this means "high asbestos".*

While most of the larger contaminant sources and public areas (such as former vermiculite processing plants, schools, and ball fields) have already been cleaned up, Region 8 has discovered several new "public" areas of contamination in Libby as well. These include J. Neils Park, Riverside Park and Boat Ramp, the public golf course, the public compost pile at the county landfill, and others. Some of these, such as Riverside Park, presented immediate, unacceptable risks and were cleaned up quickly. Others, due to lower contamination levels or less likelihood of exposures, have been isolated and/or earmarked for possible future Remedial Action.

*But these are done, not current risks.*

#### IV. ENDANGERMENT DETERMINATION

The actual or threatened releases from this Site, if not addressed by continuing to implement the response actions set forth in the original Action Memorandum and subsequent Amendments, may present an imminent and substantial endangerment to public health, welfare, or the environment. *cite to past ARMs for description of toxicity, disease, etc.*

#### V. EXEMPTION FROM STATUTORY LIMITS

The original Libby Action Memorandum dated May 23, 2002 provided the documentation required to meet the NCP Section 300.415(b)(2) criteria for a Removal Action and the NCP Section 300.415(b)(5)(i) emergency exemption from the \$2 million and one year limits on Removal Actions. The most recent Action Memorandum Amendment dated May 2002 expanded the scope of Removal Actions and raised the approved removal ceiling to \$55,635,000. The conditions necessitating Removal Actions and the emergency exemption still exist. The difficulty and costs of mitigating these conditions have proven higher than originally estimated. Region 8 is requesting an additional increase to the removal ceiling in order to continue and complete work approved in the May 2002 Amendment.

Removal Actions being conducted in Libby are also expected to be consistent with future Remedial Actions, and thus meet the criteria for a consistency exemption from the \$2 million and one year limits on Removal Actions as set forth in the NCP Section 300.415(b)(5)(ii). There are several reasons for this:

- Libby Asbestos, the contaminant of concern in Libby, is a naturally occurring mineral. There are no known treatment technologies that can diminish or reduce the toxicity of asbestos. To address exposures from asbestos, the only cleanup options available are to remove it or to contain it. For Removal Actions at the Site, Region 8 has used a combination of both as appropriate.
- Because asbestos use was widespread in the past, asbestos abatement is well understood. There are a limited number of options available for cleanup. Most importantly, when asbestos is determined to be friable, the preferred mechanism to address potential exposures is to remove the source. [REDACTED] *no*

1/13 all suggests RI/FS should be done unless you point out really hard issue, action level.

- Investigations have shown that sources of Libby Asbestos, including, but not limited to, contaminated soil, vermiculite insulation, and vermiculite processing wastes, are prevalent throughout Libby. Past investigations have clearly shown that, when disturbed, these sources can release asbestos to the air and have the potential to contaminate indoor dust. The primary objective of the Removal Actions in Libby is to remove or isolate these sources. Any future Remedial Actions must also employ source removal as a key component of cleanup and response.
- Various cleanup techniques were evaluated during the initial emergency response cleanups of residential/commercial properties. While the basic options are limited, exactly how, when, and to what degree each option is applied is less straightforward. Region 8 used this experience to evaluate the efficacy of various approaches and to refine our cleanup strategy. This information will be used in the RI/FS. *We continue to look for ways to ensure the cleanup is cost effective. Does this suggest it's not now.*
- Because a Baseline Risk Assessment and ROD are not yet complete, there exists some uncertainty as to (1) which properties with "lower" levels of contamination will require cleanup and (2) how protective each cleanup should be. However, to ensure that Removal Actions are protective and consistent with future Remedial Actions, Region 8 has taken a conservative approach and adopted protocols that help ensure we will not have to clean up a property twice. In general, we only start cleanup if a property has conditions that warrant emergency response, but once a cleanup occurs, we remediate to a level expected to be protective for the long-term. Post-cleanup sampling has validated the efficacy and protectiveness of the cleanups. This approach ensures the worst risks are addressed first and is cost-effective, protective, and well accepted by the community and the State of Montana. *Good*

## VI. PROPOSED ACTIONS AND ESTIMATED COSTS

### A. Proposed Action Description

The Action Memorandum Amendment dated May 2002 set forth the proposed actions. Other than increased numbers of properties likely requiring cleanup, and increased difficulties of conducting the actions, the scope has not changed. *Isn't the scope really, the # of properties?*

### B. Contribution to remedial performance

The Site was made final on the NPL in October 2002. While cleanup at the Site continues to be conducted using removal authority, the Site was transitioned to the Region 8 Remedial Program *immediately* after final listing on the NPL. Collection of information and data necessary to perform an RI, and ultimately to write a Record of Decision, is occurring concurrently with the conduct of the Removal Actions. Information and experience gained during the removal actions is used to continually refine the process and to plan for future work. Likewise, as more information is learned about the nature of the contamination and the risks presented, adjustments to the cleanup approach are made as necessary. *Wherever possible, effort is made to focus on the most contaminated properties first, and also to ensure that properties are cleaned to a*

sufficient level such that cleanup must occur only once. This approach is protective as well as cost effective. As described in Section V of this Amendment, it is expected that the cleanup approaches used during Remedial Actions will be similar to, and consistent with, those used during Removal Actions.

#### C. Description of alternative technologies

EPA attempts to employ the most appropriate technologies for addressing risks, but there are no known alternative technologies available at this time for addressing asbestos. Cleanup occurs through the systematic use of several existing technologies, including removal, containment, and encapsulation. Wherever necessary and possible, Region 8 considers unique applications of these technologies to meet site-specific cleanup objectives.

*How do we decide between these?*

#### D. EE/CA

No EE/CA is required.

#### E. Applicable or relevant and appropriate requirements

See the Federal and State ARARs identified and/or discussed in the original Action Memorandum dated May 23, 2000.

#### F. Project Schedule

The total number of properties requiring cleaned up will not be known until publication of a ROD, expected in late 2005 or early 2006. Based on current knowledge, Region 8 estimates that approximately 1400 properties will require cleanup, of which 350 have already been addressed. While a large percentage of remaining properties will meet the conditions set forth in the May 2002 Action Memo Amendment for emergency response, emergency response cleanup using removal authority will continue only until publication of a ROD, at which time cleanup will continue using remedial authority. Remedial authority will then be used to clean up both classifications of properties: those that meet emergency response criteria but are not yet complete, and those that may meet future criteria established for remedial action. (Note that EPA may encounter situations in the future for which removal actions are appropriate, even after a ROD is published). REGION 8 expects that approximately 170-200 properties can be cleaned up per year at current funding levels. The overall project schedule is contingent upon funding and the total number of properties requiring cleanup, but based on current knowledge, the current funding situation, and the actual date of a ROD, Region 8 estimates that approximately 1-2 years of emergency response and 4-6 years of Remedial Actions remain. 170-200 properties are scheduled to be completed in 2005.

#### G. Estimated Costs

The ceiling increase is projected to cover two years of additional Removal Actions at

Just say underestimated the scope and complexity of the cleanup.

production rates similar to those in 2003 and 2004 (170-200 properties expected to be cleaned per year). While the scope of cleanup has not fundamentally changed, the May 2002 Action Memorandum Amendment significantly underestimated the average cleanup cost per property, and the amount of oversight and management required, did not accurately account for disposal costs, and underestimated the number of properties requiring cleanup. Because of this, Region 8 has reached the removal ceiling quicker than anticipated and the job is not complete. However, after two years of investigation and cleanup, Region 8 is able to more accurately forecast cleanup requirements, both on a per property basis and overall. Because of this increased accuracy, and for simplicity, this Amendment provides only a basic, cumulative breakout of existing and proposed removal ceilings (Table 1), as well as a summary of other external costs that have been incurred that do not count against the removal ceiling (Table 2). Again, it is expected a ROD will be published within two years, and cleanup will switch to remedial authority ~~as necessary~~.

Table 1. Proposed Site Ceiling

Category	Current Ceiling (Action Memo Amendment dated May 2, 2002)	Proposed Ceiling Increase	Proposed Total
Extramural Costs	\$45,525,000	\$30,000,000	\$75,525,000
Contingency @ 20% of Extramural	\$9,100,000	\$6,000,000	\$15,100,000
Intramural Costs	\$960,000	\$100,000	\$1,060,000
<b>TOTAL</b>	<b>\$55,635,000</b>	<b>\$36,100,000</b>	<b>\$91,735,000</b>

Table 2. Other major expenditures not counted against ceiling. Note that amounts are approximate.

Task	Previous Expenditures Through CY 2004 (approximate)	Planned Expenditures CY 2005-2006 (approximate)
Phase I and Phase II Removal Sampling Investigations	\$8,100,000	0
Medical Screening Support	\$500,000	0
Contaminant Screening Study (first phase of Remedial Investigation)	\$5,000,000	\$500,000
Remedial Investigation & Risk Assessment	\$2,500,000	\$1,500,000
Performance Evaluation/ Analytical Methods Study	\$1,000,000	\$200,000
USGS Support	\$2,000,000	0
Community Involvement	\$500,000	\$500,000
Database Creation and Management	\$2,000,000	\$1,500,000
<b>TOTAL</b>	<b>\$21,600,000.00</b>	<b>\$4,200,000.00</b>

## **VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

Delayed action will result in continued public exposure to unsafe amounts of amphibole asbestos. This will increase the risk to public health and continue to burden an already impacted community.

## **VIII. OUTSTANDING POLICY ISSUES**

There are no new policy issues or considerations.

## **IX. ENFORCEMENT**

A confidential summary of Enforcement Actions is included as a separate document.

## **X. RECOMMENDATION**

This decision document represents the selected Removal Action for the removal of asbestos sources from targeted homes, businesses, and public buildings at the Libby Asbestos Site in Lincoln County, Montana. The proposed removal actions have been developed in accordance with CERCLA as amended and are consistent with the NCP. The decision is based on the Administrative Record for the Site.

Conditions at the Site meet the NCP [40 CFR § 300.415(b)] criteria for a Removal Action, and the NCP [40 CFR § 300.415(b)(5)(i)] and [40 CFR § 300.415(b)(5)(ii)] criteria for an exemption from the statutory limits. I recommend your approval of the proposed Removal Action ceiling increase.

*formal*

Approve: \_\_\_\_\_ Date: \_\_\_\_\_

Thomas P. Dunne  
Acting Assistant Administrator  
Office of Solid Waste and Emergency Response

Disapprove: \_\_\_\_\_ Date: \_\_\_\_\_

Thomas P. Dunne  
Acting Assistant Administrator  
Office of Solid Waste and Emergency Response

